Patent Claims

1. A heat exchanger having an in particular hydrophilic surface coating (2; 12), characterized in that the surface coating (2, 12) includes a gel which is produced in particular in a sol-gel process.

2. The heat exchanger as claimed in claim 1, characterized in that the sol, which functions as a coating substance in a sol-gel process, contains alkoxy compounds of elements from main group III and/or of elements from main group IV and/or of transition metals.

3. The heat exchanger as claimed in claim 2, characterized in that the transition metals belong to transition group IV and/or V.

4. The heat exchanger as claimed in claim 2 or 3, characterized in that in the alkoxy compounds some of the hydrolysable alkoxy radicals are substituted by alkyl and/or aryl radicals, or in that a mixture of pure alkoxy compounds and alkoxy compounds which partly contain alkyl and/or aryl radicals is provided.

5. The heat exchanger as claimed in one of the preceding claims, characterized in that the surface coating (2; 12) contains nanoparticles (3), coated nanoparticles and/or grafted nanoparticles (13) comprising or consisting of oxides.

6. The heat exchanger as claimed in claim 5, characterized in that oxides of the elements from main group II and/or main group III and/or oxides of germanium, tin, lead and/or oxides of the transition metals and/or oxides of zinc and/or oxides of cerium are provided.

7. The heat exchanger as claimed in claim 6, characterized in that the transition metals belong to transition IV and/or V.

8. The heat exchanger as claimed in one of the preceding claims, characterized in that the surface coating (12) contains nanoparticles, coated nanoparticles and/or grafted nanoparticles (13) comprising or consisting of hydrated oxides and/or nitrides and/or carbides.

9. The heat exchanger as claimed in claim 8, characterized in that the hydrated oxides, nitrides and carbides comprise elements from main group III and/or main group IV and/or transition metals and/or cerium.

10. The heat exchanger as claimed in claim 9, characterized in that a transition metal belongs to transition group IV and/or V or is zinc.

11. The heat exchanger as claimed in one of the preceding claims, characterized in that the nanoparticles (3), coated nanoparticles and/or grafted nanoparticles (13) have a mean diameter of from 1 to 1000 nm.

12. The heat exchanger as claimed in one of the preceding claims, characterized in that the surface coating (2; 12) includes constituents with an antimicrobial action.

13. A process for coating a heat exchanger with an in particular hydrophilic surface coating (2; 12), the surface coating (2; 12) being produced by means of a sol-gel process.

14. The process for coating a heat exchanger as claimed in claim 13, characterized in that the surface coating (2; 12) is applied by means of dipping, flooding and/or spraying.

15. The process for coating a heat exchanger as claimed in one of claims 13 to 14, characterized in that a pre-treatment by means of an acidic or alkaline pickle is carried out, with subsequent scale removal and/or a conversion treatment.

16. The process for coating a heat exchanger as claimed in claim 15, characterized in that mixed oxides and/or mixed fluorides are formed during the conversion treatment.

17. The process for coating a heat exchanger as claimed in one of claims 13 to 16, characterized in that a drying process is carried out after a pre-treatment by means of an acidic or alkaline pickle with subsequent scale removal and/or a conversion treatment.

18. The process for coating a heat exchanger as claimed in one of claims 13 to 17, characterized in that the operation of applying the surface coating (2; 12) is followed by a drying operation.

19. The process for coating a heat exchanger as claimed in one of claims 13 to 18, characterized in that a surface coating (2; 12) which contains nanoparticles (3), coated nanoparticles and/or grafted nanoparticles (13) is applied.